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The Conference Board

Productivity Needs of the United States

- *In order to avert a decline in our standard of living, we have no choice but to raise productivity.*
- *Manufacturing productivity advances, though substantial, cannot overcome stagnant efficiency in the service-producing sector.*
- *Two thirds of the U.S. economy produces services; needed productivity gains must originate there.*

Research Report No. 934

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Productivity Needs of the United States

by Audrey Freedman

A Report from The Conference Board

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From the President

This report is intended to draw attention to the realities of the productivity challenge for the United States. It is hoped that the dialogue concerning the critical role of productivity in advancing the nation's standard of living will be intensified. Certainly, the management task could not be clearer.

Special thanks go to Allen Jacobson, Chairman of the Board and Chief Executive Officer of the 3M Company and Vice Chairman of the Board of Trustees of The Conference Board, for both asking the tough questions and for actively participating in the exploration.

PRESTON TOWNLEY
President

Acknowledgment

This report is the result of several intensive discussions between Allen F. Jacobson, Chief Executive Officer and Chairman of 3M, and the author. Mr. Jacobson's intellectual curiosity led to a stimulating and fact-based dialogue. The process of question and answer, deeper question and more complex answer, inspired the creation of this report, in the hope that it will prove useful to other business managers.

Mr. Jacobson's first question was: "Given the probable developments through the end of the century—in population growth, demographic and employment shifts, needs to service international indebtedness, and likely inflation—what kind of productivity improvement does the United States need to increase our standard of living?" This complex and comprehensive question was only the beginning.

Each new question raised by Mr. Jacobson added depth to the analytic process. The dialogue continued right up to the publication of this report, and will probably expand as we come to understand the trade-offs that face us. Most importantly, the 22 industry charts shown in this report are meant to raise more questions than they answer. Mr. Jacobson's hope is that this report will incite an active management dialogue on how to increase productivity—at the firm level—in service operations.

Overview

Will Americans be able to raise, or even maintain, their standard of living in the 1990s? Right now, the evidence suggests that—given population trends and the economic burden of the 1980s debt binge—America will need substantial improvements in productivity, just to maintain standards of living. Basically, there are only two sources of economic growth: population and productivity increases. *Per capita* improvements in standard of living can only be attained in three ways:

- More people working (a higher proportion of producers)
- People working longer hours (less leisure)
- Increased levels of output per worker hour (productivity)

Chart 1 illustrates, in stark terms, the sources of increase in our standard of living, and the choices available to management and policymakers.

Population Growth

How much will population growth contribute to GNP during the 1990s? Probably about one percent a year. Right now, there is only minimal growth for all of these elements on Chart 1: total population, workforce, and hours worked.

From 1972 through 1986, our workforce grew by about 1.9 percent a year; close to 3 percent annually during the 1970s "boom." By contrast, for the rest of the century it will creep up only 1.2 percent a year, according to the Bureau of Labor Statistics (BLS). There are two factors operating here:

- Working-age population (16 and over) will rise by about .9 percent a year.[1]

[1] Total U.S. population is projected to grow by about .8 percent a year through 2000.

Chart 1
Sources of Growth

Increases in Standard of Living = Increased amount of work being done multiplied by Increased Productivity

or = or or

$$\frac{\text{GNP}}{\text{Population}} = \frac{\text{Hours Worked}}{\text{Worker}} \times \frac{\text{Workers}}{\text{Population}} \times \frac{\text{Output}}{\text{Hour Worked}}$$

To raise this factor:
1. Lengthen the (aggregate) workweek and workyear
2. Extend part-time work to full-time
3. Lower the total weeks of unemployment

To raise this factor:
1. Increase the proportion of total population that is working
   a. reverse early retirement trend of men
   b. raise women's participation
   c. increase variety of work arrangements & schedules
2. Raise the level of immigration
3. Improve labor market functioning
4. Link income support to work

To raise this factor:
1. More capital investment
2. More human resource investment (training, education)
3. More R & D, technological advance
4. Better management of resources

- Participation in the labor force will rise by only about .3 percent annually—due entirely to an increase in the proportion of women working.[2]

Productivity Growth

Consequently, most of the burden of improving our standard of living will fall on productivity, that is, raising worker efficiency. We would have to increase labor efficiency by about 1.2 percent a year (about 1.6 percent in the business sector) just to attain a "moderate" growth rate for overall standard of living of 1.5 percent a year.[3]

Is it realistic to expect productivity to grow 1.6 percent in the business sector? In fact, business has not approached that kind of record for years. Its annual productivity rises were:

- .6 percent during 1973-1979
- .9 percent during 1979-1988

Unless American management can substantially improve on recent performance, which includes both a recessionary period and a long growth phase, our per capita GNP will rise much more slowly—perhaps only .7 percent a year.

[2] The Bureau of Labor Statistics projects two possible variations on the 1.2 percent growth rate for the labor force. The scenario for slower growth—1.0 percent a year—assumes *lower* immigration, *slower* increases in women's participation, and a *faster rate of decline* in men's participation. The fast-growth scenario (not nearly as fast as the 1970s or even the 1980s) of 1.4 percent annually assumes the opposite trends.

[3] Built into this projection, among other assumptions, are:
- Normal business cycles
- Average annual inflation of 3.5 percent
- World GNP growing at 2.6 percent annually

We have to remember that during the 1990s, part of our GNP will not be available, either for consumption or for investing in future growth. Instead, it will be diverted to:

- Paying interest on our heavy international debt
- Reducing the principle
- Servicing government deficits built during the 1980s

These additional drains will produce virtual stagnation in the standard of living *overall.* In other words, the pie will not be growing. Under these unprecedented American circumstances, any gains for one group in our population (for example, the Western region or the young employed) will come at the expense of other groups. Thus, the potential for civic and political strife is greater.

Productivity in Manufacturing and Services

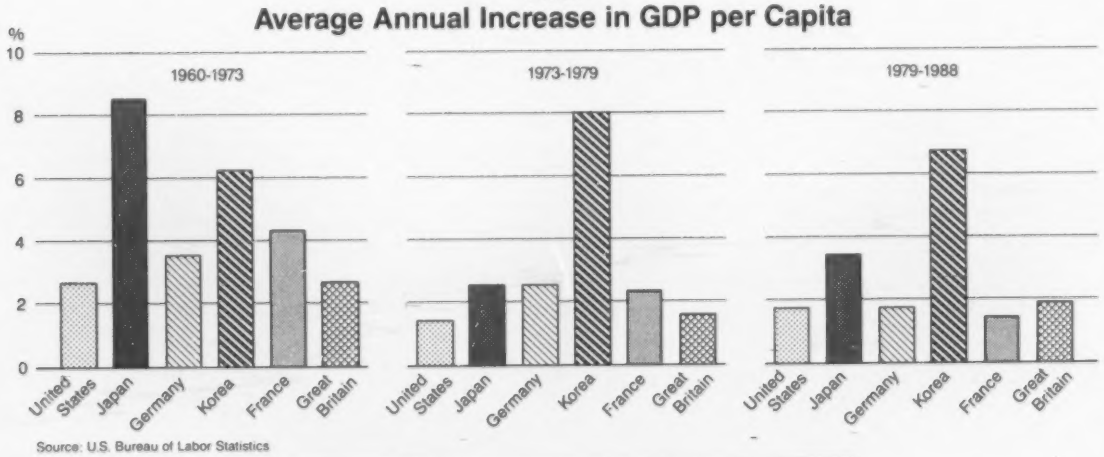
Where can we look for the kind of productivity improvements that we will need? Manufacturing, which contributes about a third of our national output (see Chart 3), had an average productivity growth of over 3 percent during the 1980s. Non-manufacturing, intangible product industries have not done as well. Since they now represent about two-thirds of the national output, they bear a major part of the burden of raising national productivity.

Prospects for the coming decade, shown in Table 1, are not very strong:

- Manufacturing may gain between 2 and 3 percent a year.
- Agriculture will do better.
- Construction and mining will show virtually no improvement.

Chart 2

Average Annual Increase in GDP per Capita



Source: U.S. Bureau of Labor Statistics

The economies of Korea and Japan are providing far greater improvement in standards of living than U.S. and European economies.

- Services such as retail and wholesale trade, real estate, business and professional services, and government will raise productivity less than 2 percent a year, even under the most optimistic scenario. Utilities are not much better than this.
- Communications is the brightest service spot, with expected productivity gains of over 4 percent.

Part of the problem, of course, is that we still have not discovered how to measure productivity in services. There are no satisfactory ways to define and measure the "output" of a service such as medical care, or accounting and legal assistance. Some definitions are based on deflated total receipts of the service industry. Most other output definitions result in a circular kind of measurement in which output, fundamentally, equals input. Then, when such an output series is divided by input to derive productivity, the result is zero growth!

Talking about "the service sector" in broad terms poses a barrier as well, because these industries are so varied, and on so many dimensions. We would need to look at specific service products, at diverse markets and delivery systems, and at widely differing technologies. There is always the tendency to return to goods-production technology and product-oriented thinking—because goods are so much clearer. Thus, the conventions of manufacturing impede our understanding of the productivity of *all* service operations, even those that take place inside large-size "manufacturing" companies.

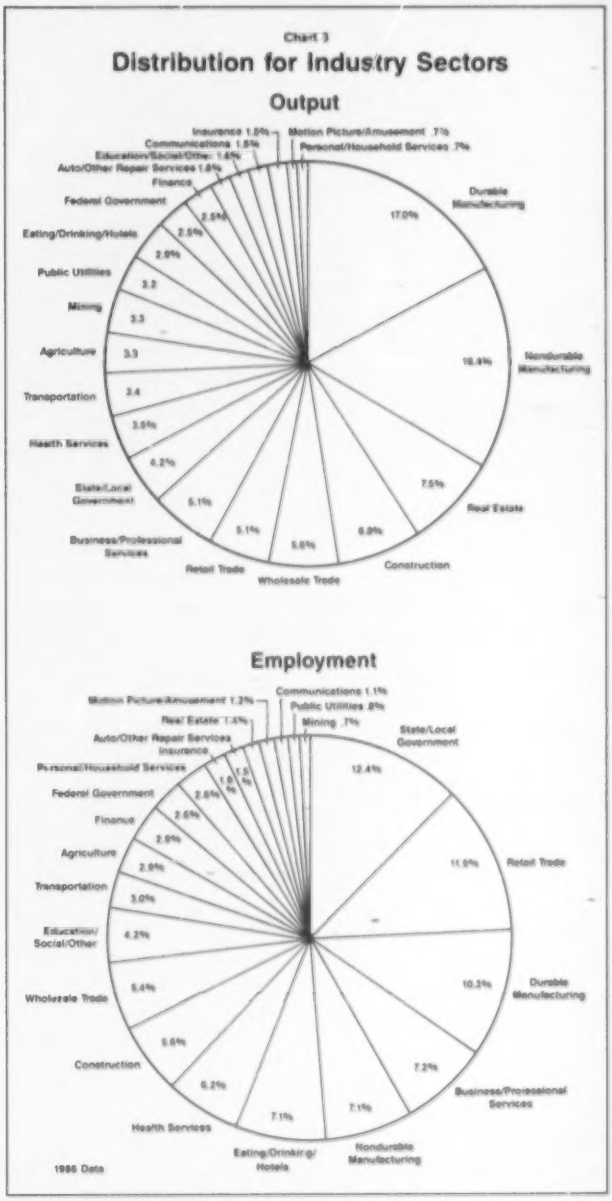
For productivity improvement to take place in service industries, however, it is essential for managers to focus on a micro-level definition of output—in order to find ways of producing that service micro-output more efficiently at lower cost. Thus, each service transaction, even though it might not qualify as a final output indicator, can in fact be handled more productively. Each micro-improvement will raise productivity in the industry as a whole.

There are 22 industry charts in this report, matching the sectors shown in Chart 3. Text accompanying each industry-level chart discusses the projected growth rates for output, employment, and productivity particular to that industry. A brief description of output, which will exemplify the definitional problems in many services, is included.

Sources of Productivity Growth

What raises productivity? In general, there are four factors (see Chart 1):

1. More capital investment. This brings more resources to bear in the production of services or goods by putting more capacity in the hands of employees. It may substitute capital equipment for labor, thus reducing work hours for the same amount of output. Capital investment permits economies of scale as well, thus raising the productivity of both labor and capital itself. Transportation, communications, and some parts of retail trade are illustrative.



2. Greater investment in human resources. Training directly raises employees' ability to increase their output or quality, or both. Human resource investment can:

- Help employees understand business objectives
- Help the firm operate with less supervision
- Raise skill levels
- Promote self-direction and innovation
- Raise commitment to work in the general population
- Produce the next generation of technical people and managers

Table 1
Annual Rate of Productivity Increase

	1982-86	PROJECTIONS 1986-2000		
		Low	*Moderate*	*High*
Total	1.3	.7	1.2	1.6
Agriculture	3.3	2.7	3.3	3.9
Mining	6.9	.1	.3	.3
Construction	1.9	- .7	.3	1.2
Durable mfg	4.0	2.9	3.1	3.4
Nondurable mfg	2.1	1.5	2.2	2.4
Transportation	1.9	.8	1.5	2.0
Communications	.3	3.9	4.4	4.5
Public Utilities	-2.5	1.2	1.6	2.1
Wholesale trade	4.0	.3	1.1	1.8
Retail Trade	2.8	1.1	1.5	2.0
Eating/drinking/hotels	- .7	- .5	- .2	.2
Finance	4.3	.3	1.0	1.1
Insurance	- .9	.1	.8	1.0
Real estate	-1.5	.4	.9	1.2
Personal/household	.3	.2	.8	.9
Business/professional	-2.1	- .3	.3	.5
Auto/other repair ser.	- .5	- .1	.2	.4
Motion pict./amusement	- .7	1.8	2.2	2.3
Health services	.8	.5	.6	.8
Education/social/other	1.2	.7	1.5	1.5
Federal Government	.9	.9	1.0	1.1
State/Local Government	.2	.8	.9	1.0

3. Technological advance. This is akin to general capital investment, but it is singled out to emphasize the importance of innovation. Technical advances renew the economy's capacity to produce the highest value-added products and services. The "competitive edge" in free economies increasingly requires a rapid rate of discovery *and adoption* of new processes, techniques, and products. Today, this is most obvious in industries producing or using computer and communications systems, laser applications, genetic engineering, and "new" materials such as composites—but the principle applies to many industries.

4. Just plain better management. This takes place at the lowest level and smallest units of the corporation, the "micro" level, where actual operational efficiencies can be realized, one detail at a time. It is also possible for top leadership to create an atmosphere that will encourage and invigorate such efforts throughout an enterprise.

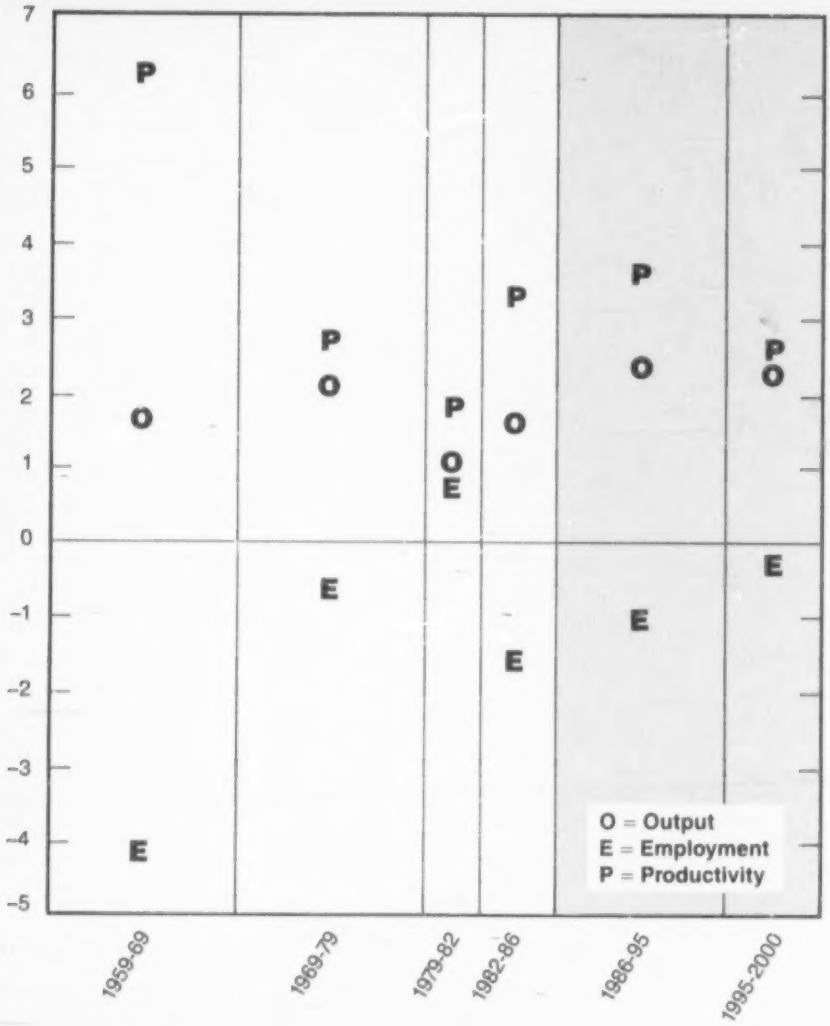
In theory, competition ensures that resources will be managed efficiently in private industry. In practice, most businesses evolve all kinds of roadblocks that need to be removed, such as:

- Ad hoc, rather than strategic, use of technology
- Creativity blunted by conventional thinking or red tape
- Outdated and rigid "standard operating procedures"
- Overstaffing
- Control-seeking (rather than entrepreneurial or developmental) management
- Insufficient communication within the business hierarchy

Plainly, productivity increases are critical to reversing the erosion of our American standard of living. Just as plainly, business management is responsible. If we do not do our job of managing better, and quickly, the entire society will suffer.

The data used for the following 22 industry charts are from unpublished material produced by the economic growth project of the United States Bureau of Labor Statistics (BLS). The projections for output, employment, and productivity growth (or decline) are from the "moderate" or middle scenario within the BLS growth model. Specifications as to the definition and measurement of output or "product," as well as details for the industries shown here, are available from The Conference Board. All output data are analysed in constant dollar terms (that is, deflated). The charts' left-hand scale shows average annual rates of change, and the vertical bars represent the specified time periods. *The left-hand scales are each different to facilitate presentation.* The two time periods encompassing 1986-2000 are BLS projections. Mr. Ronald Kutscher, Associate Commissioner for Economic Growth and Employment Projections, has provided technical and analytic assistance throughout the production of this report.

Agriculture, Forestry, and Fisheries



Level in 1986 of:
Employment
(Thousands of Jobs) 3,257
Output
(Millions of 1982$) 221,094

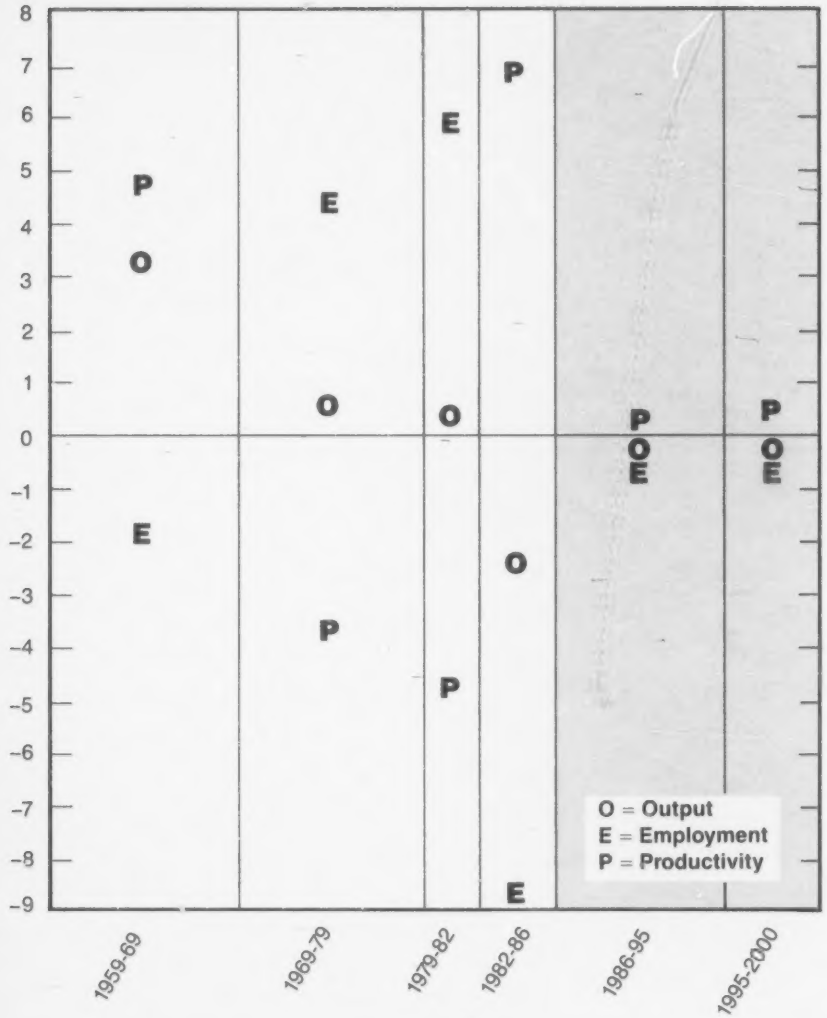
Output growth over the decades 1959-1979 remained at fairly steady annual rates of around 2 percent, and faltered only slightly, to one percent, during the 1979-1982 cycle. From now until the end of the century, a return to growth rates above 2 percent is expected.

Total employment in these extractive industries shrank at an annual rate of 4.2 percent during the decade 1959-1969. Over the entire period 1959 through 1986, its contraction averaged 2 percent a year. There was only a small growth during 1979-1982. For the rest of the century, annual rates of employment reduction will be about .8 percent. Even under the most optimistic scenario, in which output grows over 3 percent annually, employment shrinks .6 percent a year.

Productivity improvement has been strong, averaging 4 percent over the quarter-century. In the early period, it was 6.2 percent, declining to its lowest point of 1.8 percent during the 1979-1982 cycle. Further productivity increases are expected to average about 3.3 percent a year; 3.9 percent in the "optimistic" scenario.

Within this sector, some industries are expected to experience greater productivity gains, namely: field crops (such as grains and cotton), tobacco, vegetables, and fruits. Their output gains will be about 3 percent a year, employment reductions over 2 percent, and productivity will rise over 5 percent annually. This segment has about twice as many employees as livestock production, but less than 10 percent higher total output. Livestock production is expected to see roughly 3 percent productivity gains; while forestry, fishing, and agricultural services will have only 1.3 percent productivity increases.

Mining



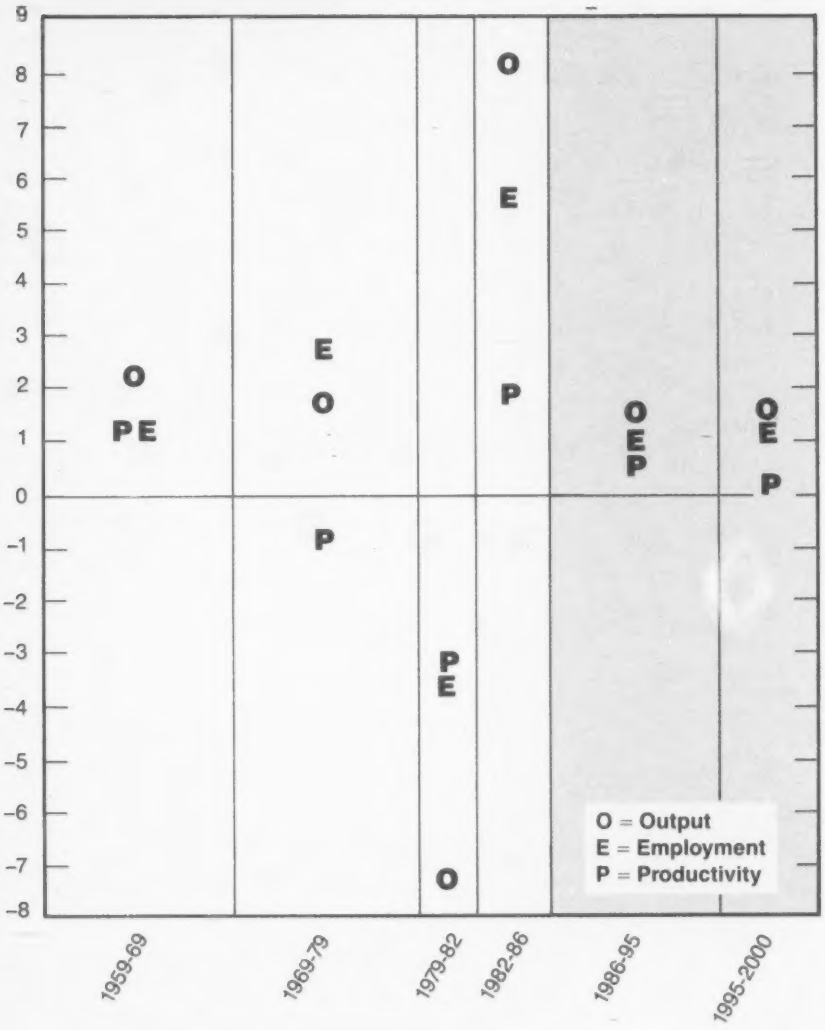
Level in 1986 of:
Employment
(Thousands of Jobs) 810
Output
(Millions of 1982$) 223,485

Mining industry output, at about the same level as agricultural output (see pie Chart 3), has been stagnant or declining since the 1970s. It is expected to remain flat throughout the rest of this century. Within the industry there is a great deal of variation: oil and gas field services, after declines during 1982-1986, will experience strong growth; coal mining will grow; outputs of crude petroleum, natural gas extraction, and metal mining will decrease.

Employment trend lines have been volatile. After steady declines in the 1960s, jobs in mining rose rapidly through the 1970s, then began dropping at nearly a 9 percent annual rate in 1982-1986. For the rest of the century, modest declines are expected. All segments of the industry will have employment declines, except oil and gas field services (such as exploration service), with the greatest drop in metal mining jobs.

Productivity trends have been equally jagged, almost exactly the mirror opposite of employment. Strong gains during the 1960s were followed by substantial productivity declines until the early 1980s. A major productivity increase during 1982-1986 is expected to be followed by stagnant productivity for the rest of the century. Within the industry, all segments are expected to show productivity gains, except for crude petroleum and natural gas extraction. This segment, however, is such a large part of the industry that its slight productivity decline will outweigh the growth expected for coal mining, oil and gas field services, metal mining, and non-metallic mining.

Construction



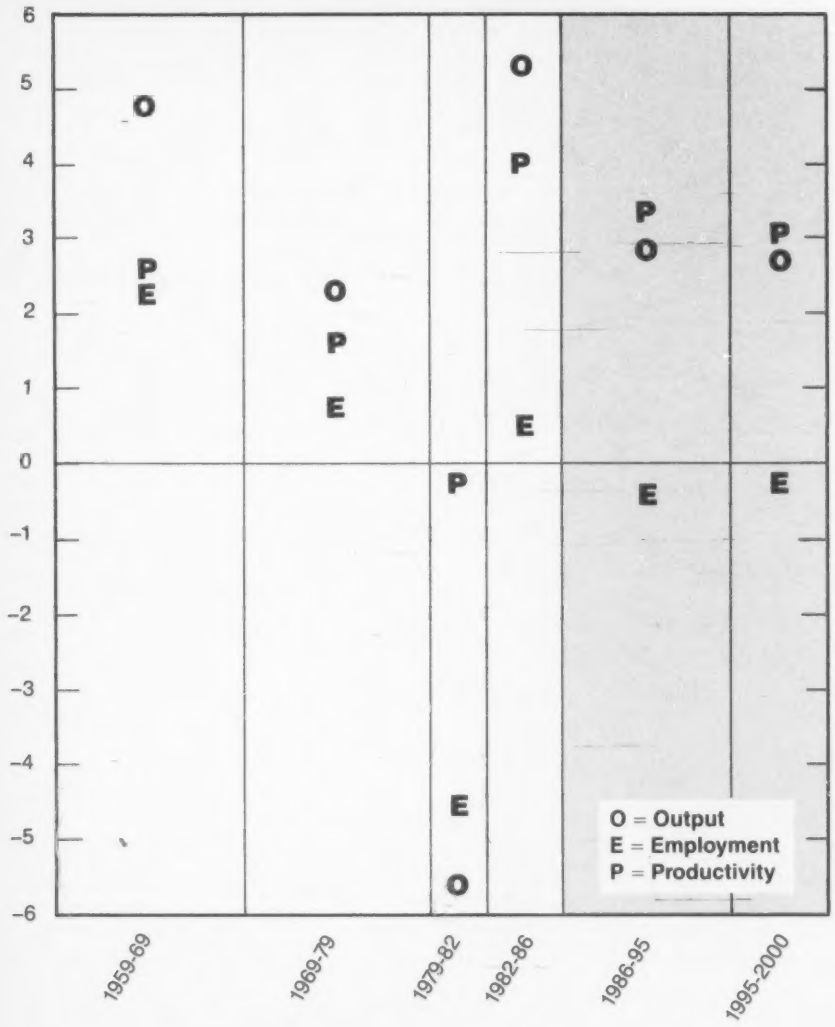
Level in 1986 of:
Employment
(Thousands of Jobs) 6,308
Output
(Millions of 1982$) 461,663

Output levels are seriously affected by cyclical conditions, and are expected to rise about 1.4 percent through the end of the century. Stronger gains are expected for office and other commercial construction, electric utility facilities, maintenance and repair construction, industrial buildings, and water and sewer facilities. Output declines are expected for multiple-unit housing construction, farm housing, local transit facilities, dams, and reservoirs.

Substantial employment growth during 1982-1986 will give way to annual increases of about 1 percent from now on. Even in a "high economic growth" scenario, annual rates of employment will only increase about 1.5 percent.

Productivity improvement in this labor-intensive industry has been weak, and negative growth trends prevailed from 1969 through 1982. Some improvement, to rates of increase just under 2 percent, occurred during the mid-1980s, but this is expected to diminish to nearly zero for the rest of the century.

Durable Manufacturing



Level in 1986 of:
Employment
(Thousands of Jobs) 11,477
Output
(Millions of 1982$) 1,151,403

	Output		Employment		Productivity
	1986 Volume in Millions of 1982 Dollars	Change*	Total Jobs, 1986 (Thousands)	Change*	Change*
Durable Manufacturing	**$1,151**	**2.7%**	**11,477**	**-.3%**	**3.1%**
Transportation equipment	293	1.7	2,029	1.2	3.1
Machinery, except electrical	231	4.5	2,103	*	4.3
Electrical and electronic equipment	173	3.9	2,134	0.0	3.9
Fabricated metal products	131	1.8	1,451	.6	2.5
Primary metals	102	-.1	796	-1.9	2.1
Instrument and related products	57	3.7	717	.6	3.1
Lumber and wood products	56	1.9	768	-.1	2.1
Stone, clay, and glass products	53	1.4	608	-.7	2.1
Furniture and fixtures	30	3.1	518	.8	2.4
Miscellaneous manufacturing	26	1.9	406	.8	2.9

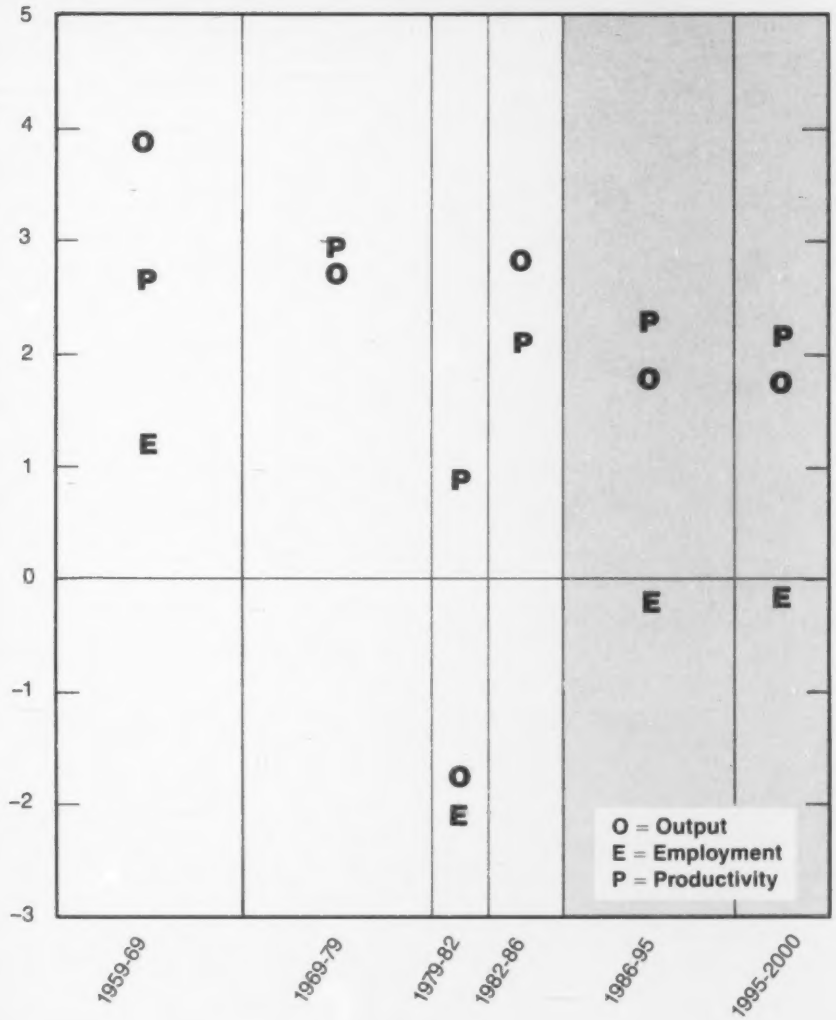
* Average annual rate of change, 1986 - 2000

Output has been growing strongly in this sector, with the exception of the cyclical years 1979-1982. For the rest of the century, output growth is expected to moderate to levels close to those of the 1970s. Within the durable grouping, transportation equipment (the segment with the highest output levels) is expected to grow only about 1.7 percent a year; while "non-electrical" machinery, the second largest segment, will grow the fastest at 4.5 percent a year. Above-average growth will also occur in electrical equipment, instruments, and furniture.

Employment increases have been modest, after substantial cutbacks during the most recent business cycle. For the future, gradual reduction in employment is expected. Primary metals will see average annual declines of about 1.9 percent, and transportation equipment may experience further declines averaging about 1.2 percent a year. All other shifts will average less than one percent annually in either direction.

Productivity growth has been strong in durable goods manufacturing, with the exception of business downturn years. For the rest of the century, it is expected to grow more slowly than in 1982-1986, but still positively at 3.1 percent. "Non-electrical" machinery, with that strong output growth noted above, will accomplish this without adding much labor; its productivity growth will average about 4.3 percent a year. The only other sub-industry above the group average is electrical equipment, at 3.9 percent. These two industries account for so much of the total durable goods sector that they outweigh the rest (which have between 2.1 and 3.1 percent productivity growth expectations).

Nondurable Manufacturing



Level in 1986 of:
Employment
(Thousands of Jobs) 7,907
Output
(Millions of 1982$) 1,114,992

	Output		Employment		Productivity
	1986 Volume in Millions of 1982 Dollars	Change*	Total Jobs, 1986 (Thousands)	Change*	Change*
Nondurable Manufacturing	**$1,115**	**1.8%**	**7,907**	**-.3%**	**2.2%**
Food and kindred products	293	1.5	1,649	-.8	2.3
Petroleum and coal products	221	.6	188	-2.0	2.6
Chemicals and allied products	190	2.6	1,075	-.5	3.1
Printing and publishing	104	3.0	1,570	1.2	1.9
Paper and allied products	91	2.4	676	-.2	2.7
Rubber and miscellaneous plastics products	70	3.1	795	.6	2.6
Textile mill products	66	1.6	712	-1.0	3.0
Apparel and other textile products	55	1.3	1,128	-1.3	2.6
Tobacco manufacturers	18	-.2	59	-1.8	1.8
Leather and leather products	7	1.5	155	-3.1	1.5

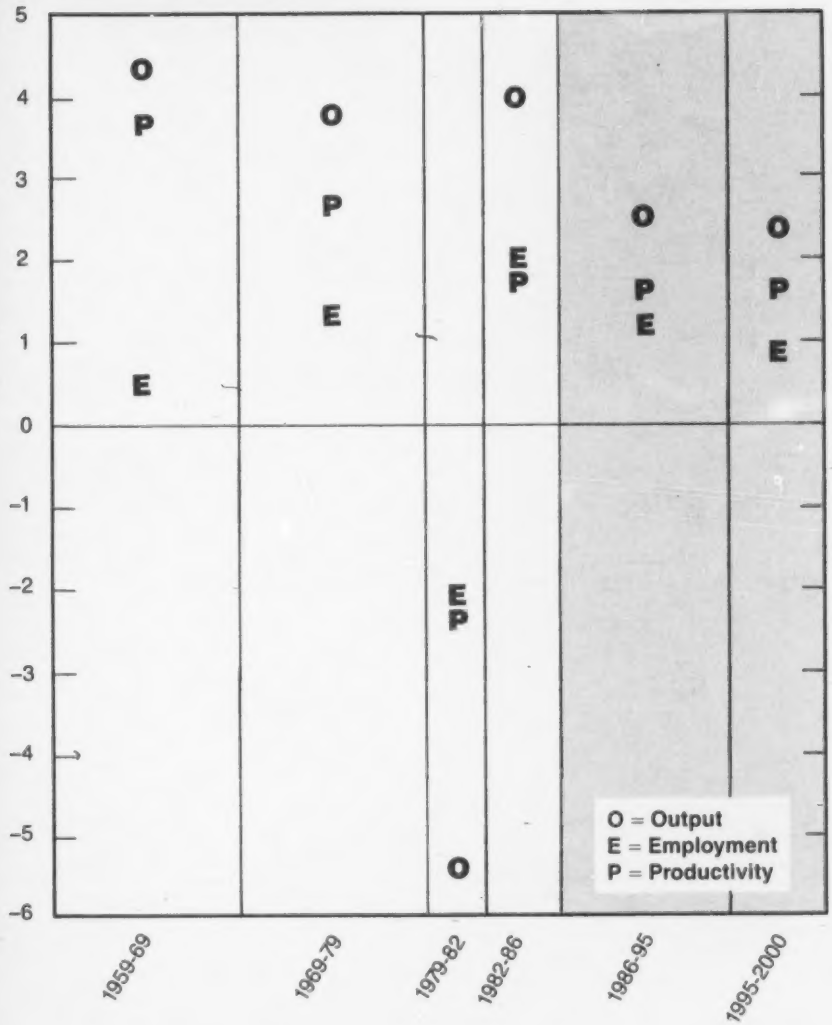
* Average annual rate of change, 1986 - 2000

Overall output growth in these industries has been positive, with the exception of 1979-1982, and is expected to remain just under 2 percent for the rest of the century. However, there continues to be wide differentiation within the sector. Expected output growth rates are 3.1 percent for rubber and plastics, 3 percent for publishing, 2.6 percent for chemicals, and 2.4 percent for paper. Yet output is expected to decline at a 1.5 percent rate for leather products (the smallest industry in this sector), and .2 percent for tobacco (the next smallest).

Employment is expected to decline in every part of this group, except publishing, rubber, and plastics, where only small gains will occur. The biggest share of total employment is held by the labor-intensive food processing industries, but this share has been shrinking gradually through higher productivity for decades. Clothing manufacture, also labor-intensive, has reduced employment levels through productivity increase (along with modest growth in output). Textiles, in spite of fairly strong output growth in recent years, has also been able to decrease employment slightly through increases in productivity. In each of these sub-industries, specific technology applications have had employment-reducing effects during the past two decades.

Productivity increases are expected to average a moderate 2.2 percent, overall, for the rest of the century. All sub-industries are in the positive column, with chemicals and textiles projected to experience the greatest annual increases, 3.1 and 3.0 percent respectively.

Transportation



Level in 1986 of:
Employment
(Thousands of Jobs) 3,346
Output
(Millions of 1982$) 227,792

	Output		Employment		Productivity
	1986 Volume in Millions of 1982 Dollars	Change*	Total Jobs, 1986 (thousands)	Change*	Change*
Transportation	**$228**	**2.4%**	**3,346**	**-1.9%**	**1.5%**
Trucking and warehousing	87	2.2	1,808	1.5	.5
Air	52	3.7	577	1.7	2.0
Railroad	30	.7	331	-3.9	4.9
Water	23	1.7	184	.9	2.8
Transportation services	14	4.7	301	2.3	2.5
Local transit	12	1.3	328	.6	.8
Pipelines, except natural gas	9	1.1	18	-.7	2.4

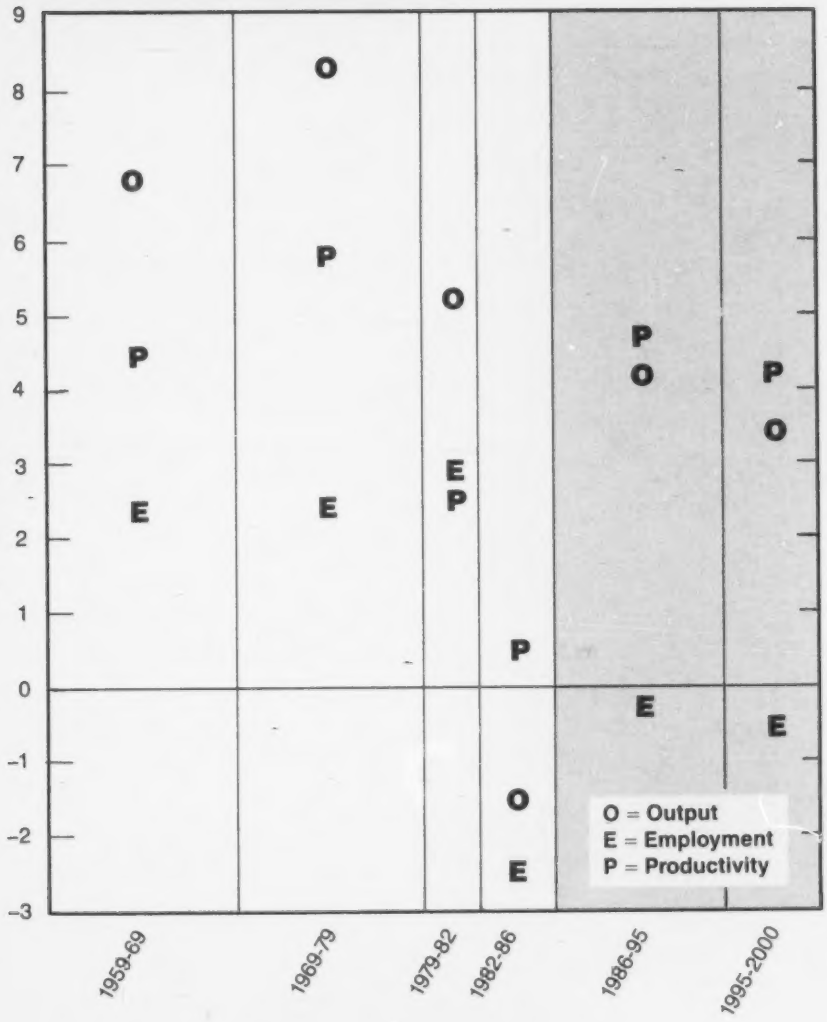
* Average annual rate of change, 1986 - 2000

Output for this group of industries is expected to rise at about a 2.4 percent rate annually for the rest of the century, a lower rate of growth than in previous decades. The fastest growth will be in transportation services, such as travel agency and transport booking operations, which, when done by businesses that are separate from transport companies, are a separate industry. These services are expected to grow at an annual rate of 4.7 percent a year. In contrast, railroad output is expected to rise less than one percent a year. Air transportation annual growth is projected at 3.7 percent.

Employment growth will average a very moderate one percent for the group overall, but there is great variation. For example, employment is expected to continue its long decline in railroading, falling an annual average rate of 3.9 percent for the rest of the century. This is about half the rate of decline experienced during the 1980s. Transportation services will be raising employment levels about 2.3 percent, airlines about 1.7 percent, and trucking about 1.5 percent on average, annually.

Productivity improvements overall are not expected to be strong in transportation. Again, there is much variation within the sector. Railroading has had substantial productivity growth in the 1960s and again in the 1980s; its record is expected to continue with 4.9 percent annual average improvements for the rest of the century. Trucking, on the other hand, will probably drop back to productivity growth rates of about .8 percent after, strong post-regulation productivity growth of 3.1 percent annually. It remains the most labor-intensive segment of transportation. Airlines are expected to see a 2 percent improvement, after productivity declines 1979 to 1986.

Communications



Level in 1986 of:

Employment
(Thousands of Jobs) 1,293

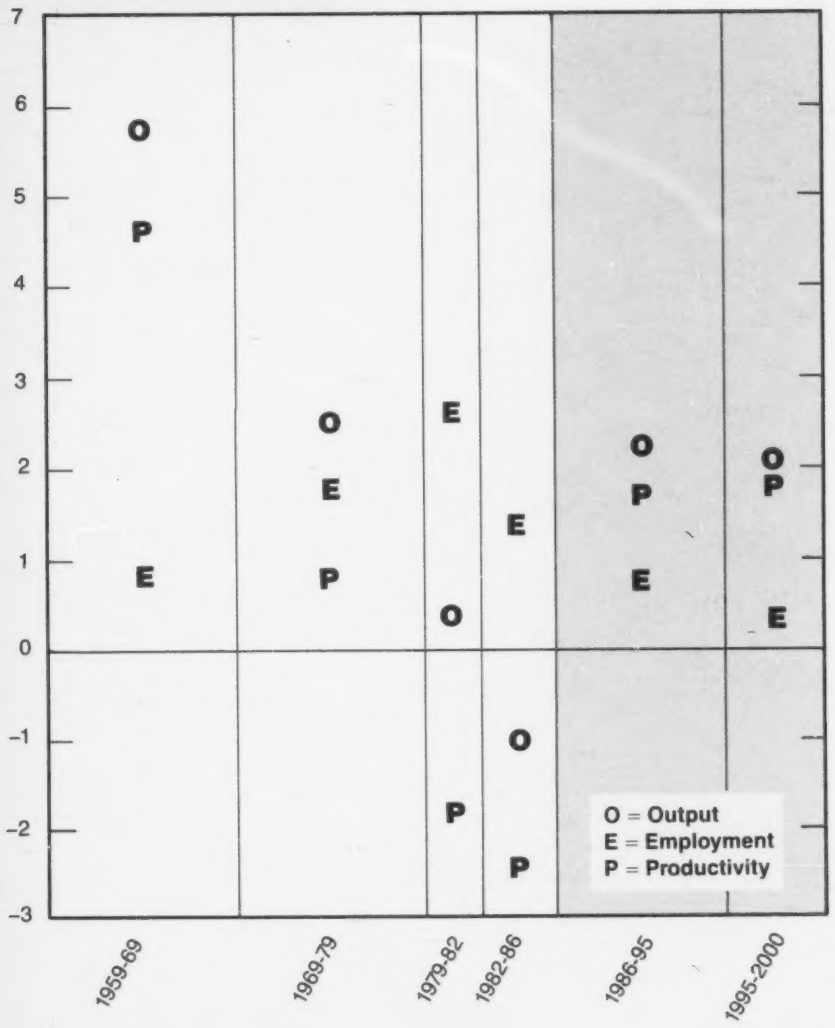
Output
(Millions of 1982$) 102,405

Strong growth rates in this industry were slowed considerably after deregulation began. However, projections to the year 2000 raise this output growth rate to 3.9 percent. If new services are further generated under a deregulated atmosphere, this growth could be far greater.

Employment has been declining after deregulation, and the decline is expected to continue for the next decade at about .4 percent annually.

Productivity improvement in telephone communication, legendarily strong before deregulation, was cut back to an annual rate of 1.4 percent from 1979-86. For the rest of the century, it is expected to rise again to a 5 percent annual average rate of improvement. If the theory holds true that there is a trade-off between innovation and productivity gains, then the new services and technological advances of the 1980s will have reached their mature, productivity-yielding stage in the coming decade.

Public Utilities



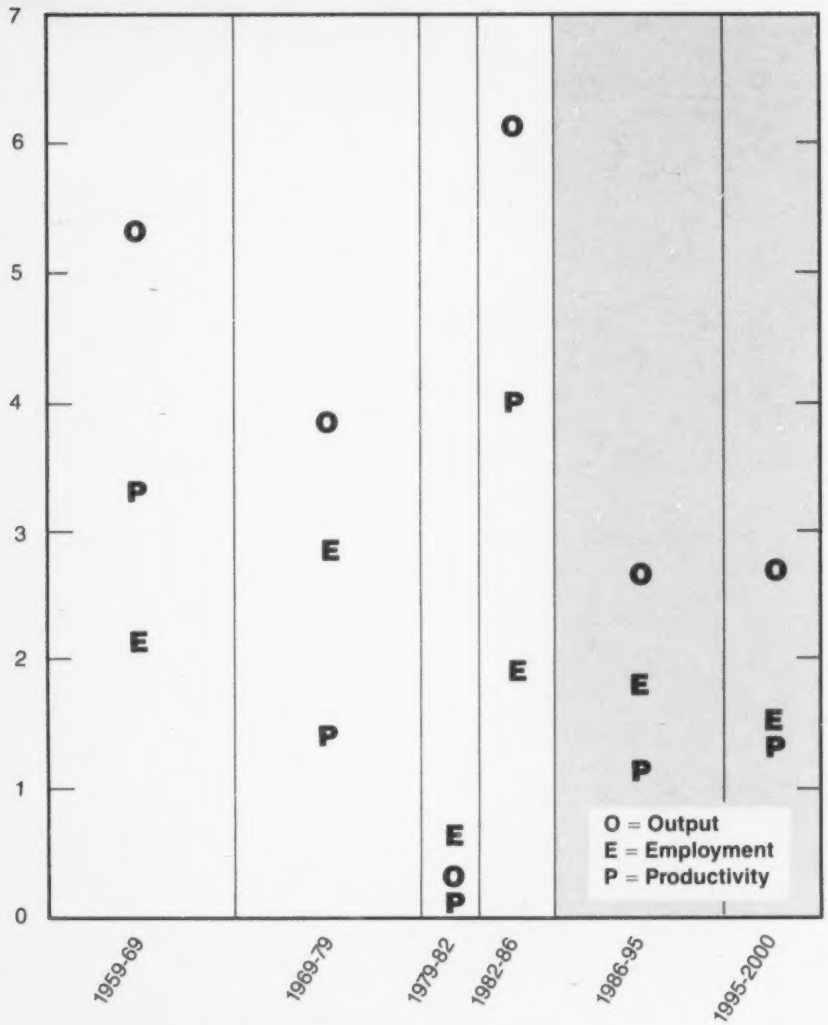
Level in 1986 of:
Employment
(Thousands of Jobs) 930
Output
(Millions of 1982$) 220,196

Output growth, substantial at annual rates of 5.7 percent during the 1960s, dropped to 2.5 percent during the 1970s, and is expected to rise at about 2.1 percent annual rates to the end of the century. Within the utility group, gas services are experiencing declines in output, and expected growth will only be at 1.5 percent rates. Water and sanitation service, on the other hand, is expected to see 3.4 percent annual average increases. Electric service so dominates total industry output levels that its own record almost constitutes the average for the group.

Employment, which has been rising between 1 and 2 percent annually during the 1980s, is expected to increase about .6 percent annually in the 1990s. Recently, electric service employment has grown faster than the total industry level, but it will fall below the industry's employment growth during the decade to come. Gas service employment will fall slightly. Water and sanitation service employment will increase at an annual rate of about 2.5 percent.

Productivity, which has been falling at an annual rate of 2.3 percent during the early 1980s, is expected to improve in the next decade. Electric and gas utilities are expected to improve by 2.1 and 1.9 percent annually.

Wholesale Trade



Level in 1986 of:
Employment
(Thousands of Jobs) 6,049
Output
(Millions of 1982$) 381,035

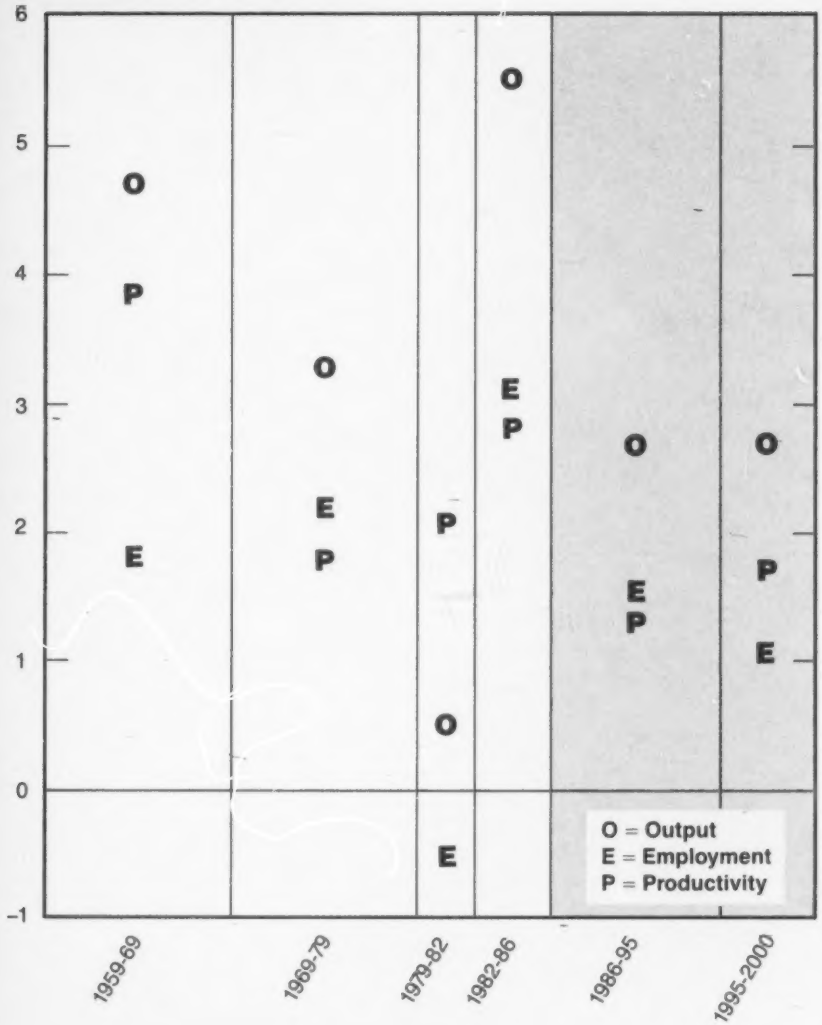
Output has been increasing rapidly, at about 6 percent annually during the mid-1980s, but is expected to moderate to 2.7 percent annual growth rates for the rest of the century. "Output" is defined as gross margins on wholesale trade activities.

Employment increases are expected to average about half of the mid-1980s growth rate, at 1.7 percent a year.

Productivity gains have been modest throughout the entire three-decade period, and are expected to average a little over one percent annually for the rest of the century.

All of the projections show one characteristic: in the near future (to 1995) the wholesale trade industry appears to be little affected by either rapid or sluggish economic growth. Output, employment, and productivity projections vary little between the high-growth and low-growth scenarios. However, for the period 1995-2000, the spread becomes substantial for all three measures. The industry begins to mirror the general economy.

Retail Trade



Level in 1986 of:
Employment
(Thousands of Jobs) 13,264
Output
(Millions of 1982$) 348,501

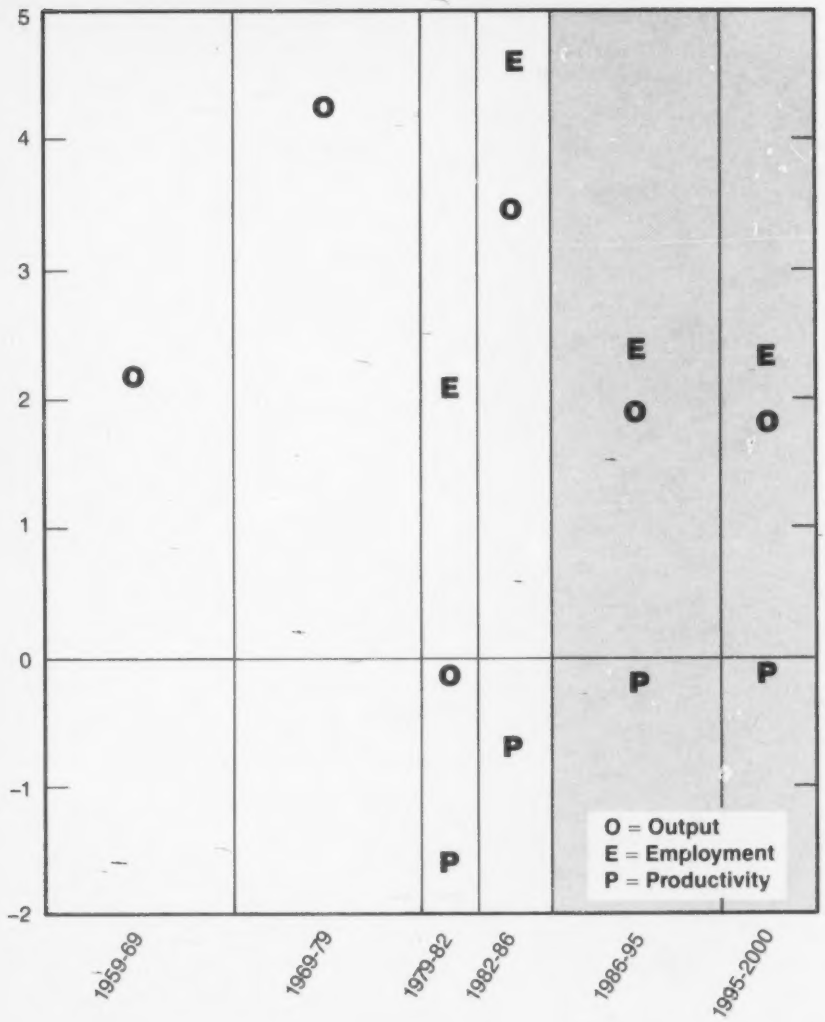
Output levels are expected to rise about 2.7 percent annually for the rest of the century. In retail trade, output is specified as "gross margins (operating expenses plus profits) on retail trade activities" and general sales taxes. Total output is slightly lower than total output of wholesale trade.

Employment is expected to show an average rate of increase of about 1.3 percent through the rest of the century. The industry has high proportions of part-time employees, but since this practice is not expected to change, it does not affect trends (only levels) in employment or hours.

Productivity improvement is expected to average a modest 1.5 percent a year for the next decade.

As in wholesale trade, projections for output, employment, and productivity are close for the high-growth and low-growth scenarios to 1995 —and much wider for 1995-2000.

The Hospitality Industry



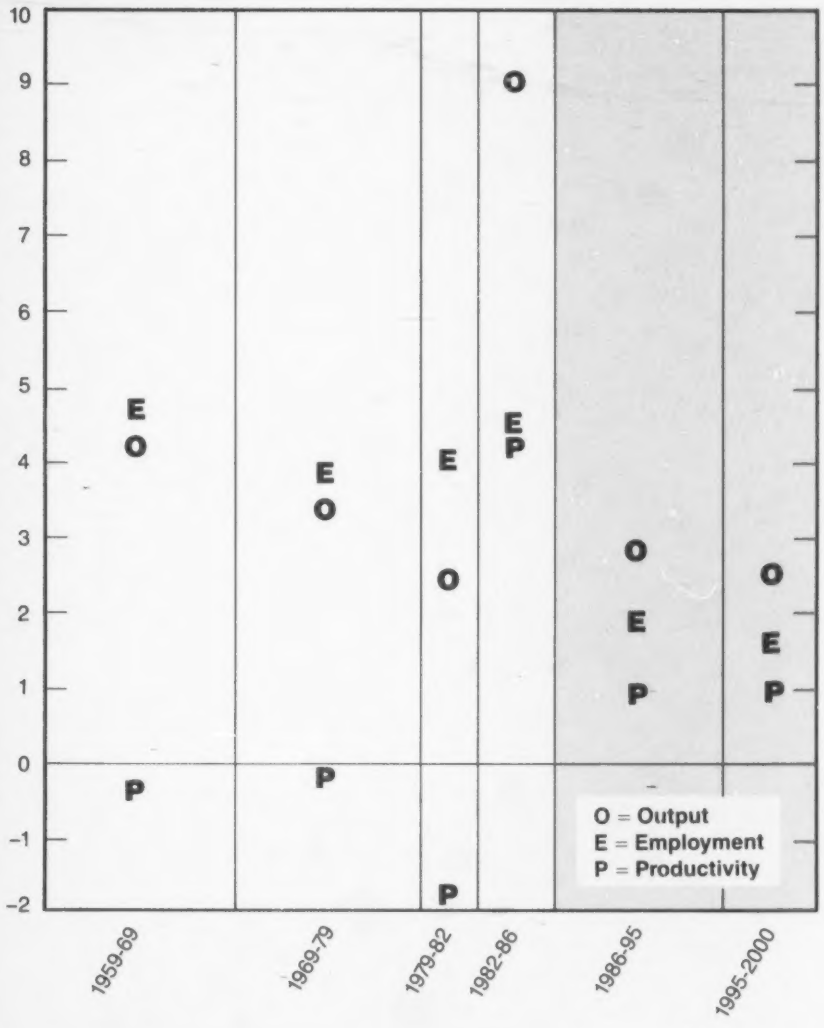
Level in 1986 of:
Employment
(Thousands of Jobs) 7,908
Output
(Millions of 1982$) 195,988

Output, which has been rising 3.5 percent a year during the mid-1980s, is expected to increase about 1.9 percent a year for the rest of the century. Output measures are: Department of Agriculture data on sales of meals and snacks, Internal Revenue Service or Service Annual Survey business receipts for hotels, and a measure of higher education housing expenses. Hotel output is a little over one-quarter the output of "eating and drinking places."

Employment is expected to rise at an annual average rate of 2.3 percent through the year 2000, half its rate of increase during the mid-1980s. Like the retail industry, much hospitality employment is part-time, but this fact does not affect trend lines because it is not expected to change.

Productivity has been declining for the entire hospitality industry, and its two main sub-industries, throughout the 1980s. For the coming decade, it is expected to decline minimally (at about a .2 percent annual rate).

Finance



Level in 1986 of:

Employment
(Thousands of Jobs) 3,220

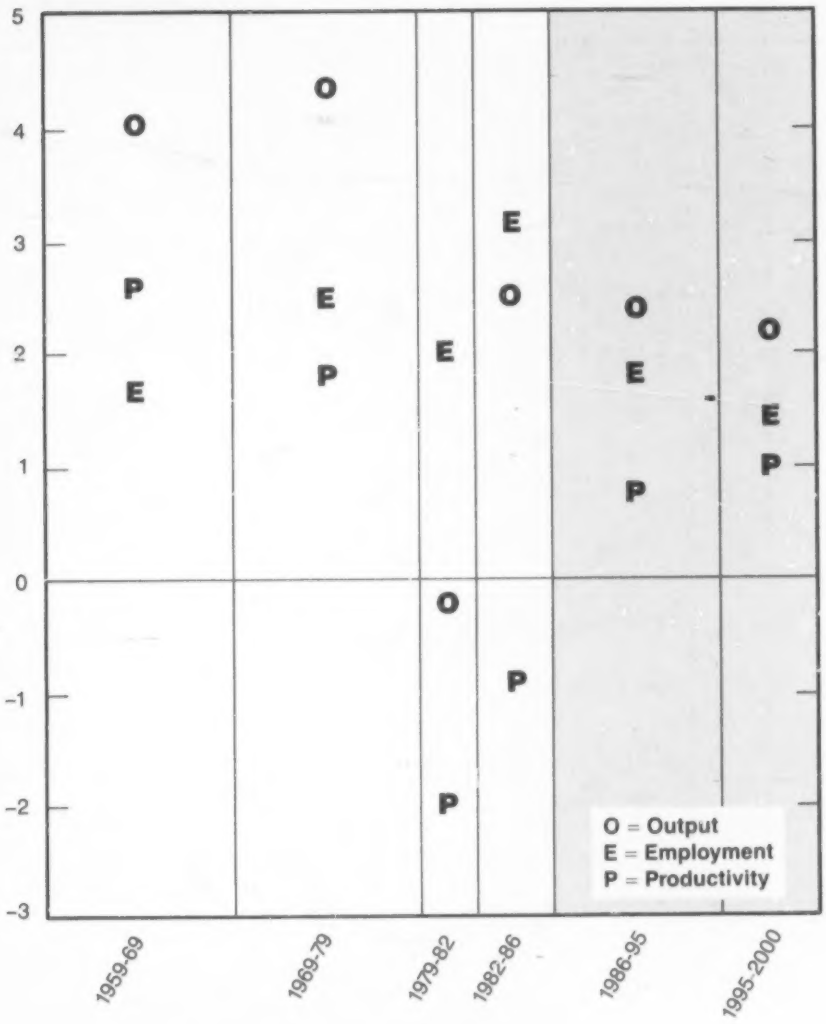
Output
(Millions of 1982$) 172,672

Output levels remained at a 6.1 percent annual rate through the mid-1980s, with output defined as finance industry (banking, security brokers, etc.) service charges. This growth is expected to moderate to a 2.7 percent annual rate for the coming decade.

Employment grew rapidly throughout the entire period since 1959; it is expected to slow to a 1.8 percent rate of increase in the coming period. More than half of total employment is in banks.

Productivity declined throughout the 1960s and 1970s, even though the computerization of "back-office" work should have raised it substantially. It seems likely that computerization and communications vastly expanded the kinds of services produced, the quality of service, and the marketing of finance products. This output effect may not have been picked up in the available output measures; it is possible to imagine that, in fact, real output of the industry has grown at far greater rates than are shown on the chart. Thus, productivity increases may have taken place.

Insurance



Level in 1986 of:

Employment
(Thousands of Jobs) 2,103

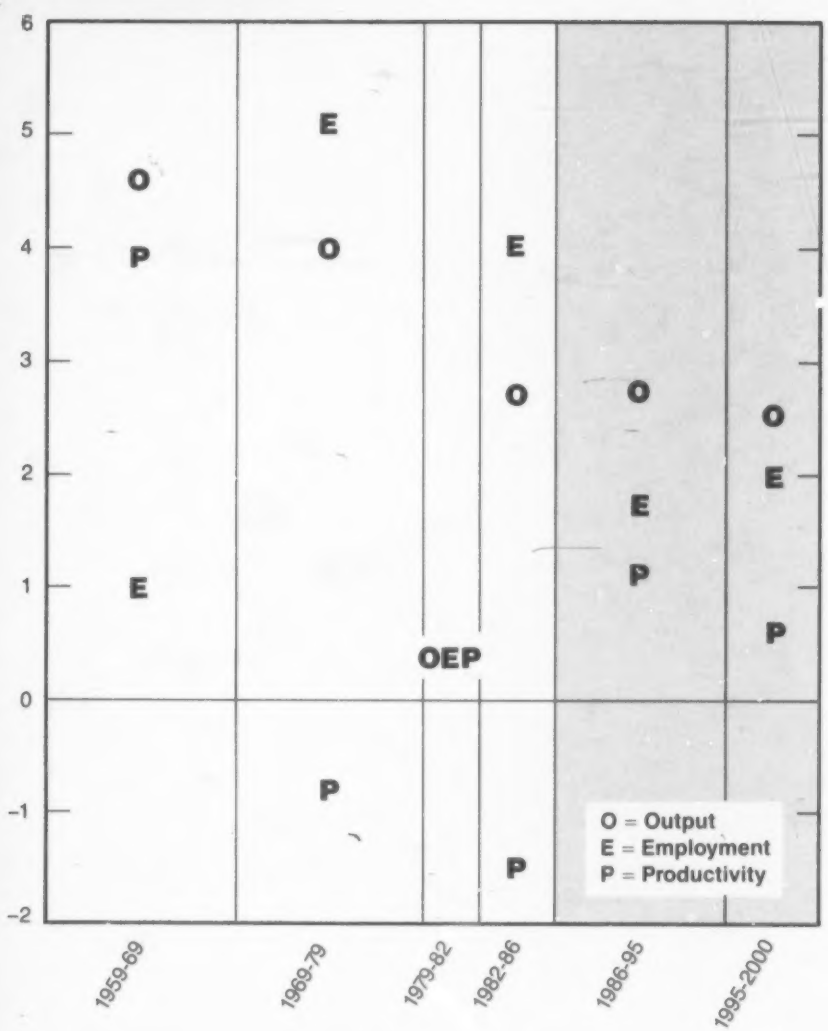
Output
(Millions of 1982$) 102,886

Output is expected to continue its moderate growth rate of the mid-1980s for the coming decade. The definition of output for this industry is the "expenses of handling insurance" in the carriers, and IRS business receipts for agents and brokers.

Employment levels are expected to rise at rates of about 1.7 percent annually, roughly half the increases of the mid-1980s.

Productivity declines, which have prevailed since 1979, are expected to be reversed into annual gains of about .8 percent in the coming decade. The comment about computer/communications technology found at the end of the finance industry text applies to insurance as well.

Real Estate



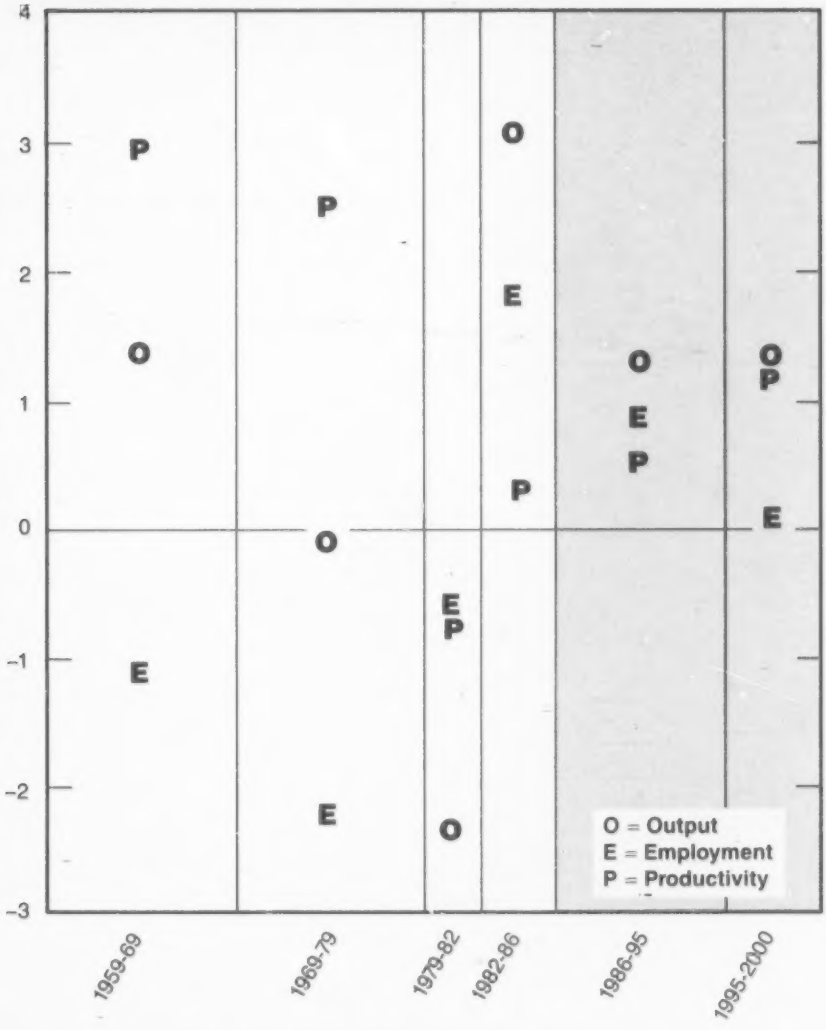
Level in 1986 of:
Employment
(Thousands of Jobs) 1,540
Output
(Millions of 1982$) 509,137

Real estate industry output is defined and measured so poorly that productivity measures are nearly meaningless. Employment increases, at a 4 percent annual level in the mid-1980s, are expected to moderate to under 2 percent a year in the coming decade.

Substantial productivity gains can be made in this industry, in spite of the lack of a meaningful definition of "product" at the macro level. Managers can improve the efficiency of operations within their firms at the micro level. For example, more efficient accounting methods can improve cash flow and control in office building rentals. Computerized information on available space can speed the search process for renters or buyers, and can attract additional customers to the efficient service-providing real estate firm.

For each of the service industries where "product" is poorly defined, and productivity is unclear at the broad industry level, *specific products can be defined at the operating level.* Where this is done, and efficiencies are introduced, productivity is advanced in critical service industries.

Personal and Household Services



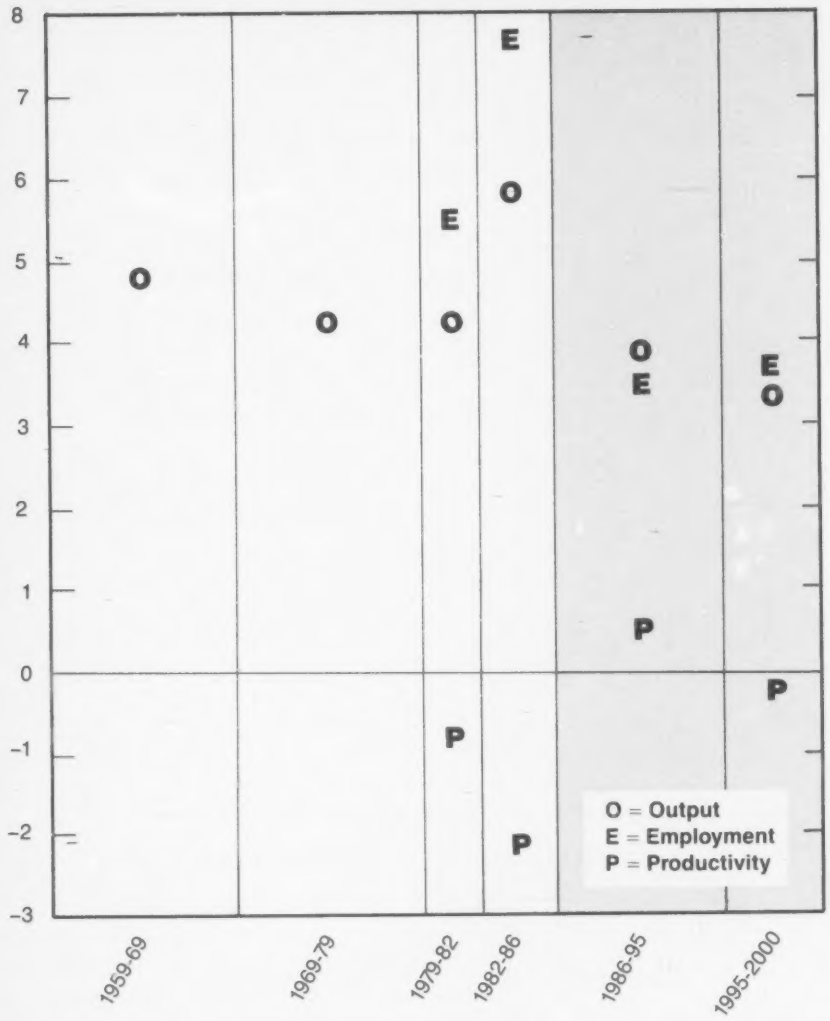
Level in 1986 of:
Employment
(Thousands of Jobs) 2,882
Output
(Millions of 1982$) 49,637

This industry, characterized by very small companies and proprietorships, contributes a miniscule amount to GNP (.7 percent)—yet absorbs 2.6 percent of total employment. It is highly labor intensive; the implications of low productivity are strong.

In considering these facts, one executive has asked: "What if these small operations and service jobs were entirely eliminated? Would the national productivity record be better?" The answer is yes—but. Without these tiny firms there would be fewer opportunities for small entrepreneurs. More importantly, there would be a great deal more dependency in the economy: people whose work contributes in some part to national output would be "out of a job," and not contributing anything to national product.

The output of laundries, shoe repair shops, health clubs, tax preparation services, barber and beauty shops, and funeral parlors is expected in increase at low rates for the rest of the century. Both employment and productivity are expected to rise slightly during the period.

Business and Professional Services



Level in 1986 of:
Employment
(Thousands of Jobs) 8,002
Output
(Millions of 1982$) 345,560

	Output		Employment		Productivity
	1986 Volume in Millions of 1982 Dollars	Change*	Total Jobs, 1986 (thousands)	Change*	Change*
Business and Professional Services	**$346**	**3.7%**	**8,002**	**3.4%**	**3%**
Computer/DP services	56	5.0	644	4.9	1
Legal services	49	2.5	939	2.9	-4
Engineering and architectural svcs	48	2.9	753	2.3	5
Consulting	40	4.3	907	3.4	5
Accounting and other services	33	3.5	742	3.2	3
Equipment rental and leasing	29	4.1	251	3.4	6
Credit reporting and other business services	24	4.0	635	4.0	1
Advertising	16	3.5	358	2.9	6
Personnel services	13	3.6	469	4.4	-6
Building services	11	3.2	819	2.8	7
Photocopy and commercial art	10	4.1	215	2.4	16
Business and professional asso	8	2.2	135	1.2	8
Detective and protective services	8	3.9	456	3.2	6

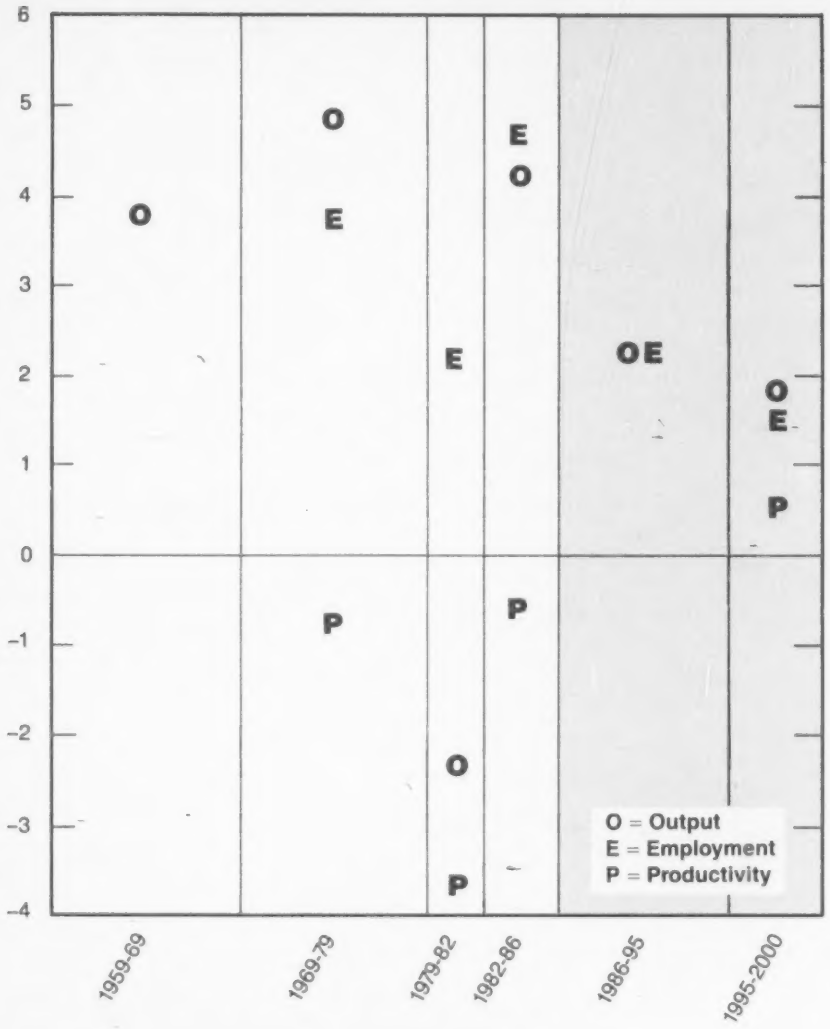
* Average annual rate of change, 1986 -2000

Business and professional services have been growing rapidly, at increasing rates, as corporations restructure their operations and "buy" more activities from specialized business service firms. The largest segments of this broad category (in terms of the output measure of business receipts) are: computer/ data processing firms, legal services, engineering and architectural services, consulting, and accounting firms. Computer/data processing is the largest; had the greatest rate of increase in receipts during the 1980s (averaging 9.2 percent yearly); and is expected to have the highest growth in the next decade (5.0 percent).

Employment size is greatest in the personnel supply (temporary help) industry, because about one million of its 1,069,000 employees are actually contracted out to work in other firms. (The product, then, is either the temporary worker, or the screening, credentialling, or training of that temporary worker.) Employment or business volume has grown, in that industry, by over 10 percent a year during the 1980s. Consulting and legal services are the next two largest employers, but their services are more likely to be provided by employees working within the consulting or law firm on a project basis. Overall, employment has been growing by about 6.7 percent annually during the 1980s, and is expected to continue at about 3.4 percent in the coming decade.

Given the output definition (of company receipts) for services, a productivity measure may be nearly meaningless. In fact, it is possible to think of the output of these industries as contributors to productivity improvements in their customer firms. By contracting for a business service, and constantly re-evaluating the purchased service, customer industries improve their flexibility and focus their business activities more effectively. Business needs for rationalization of operations, and control over costs, may have generated the strong growth that these "outside" services have experienced over the past decade.

Auto and Other Repair Services

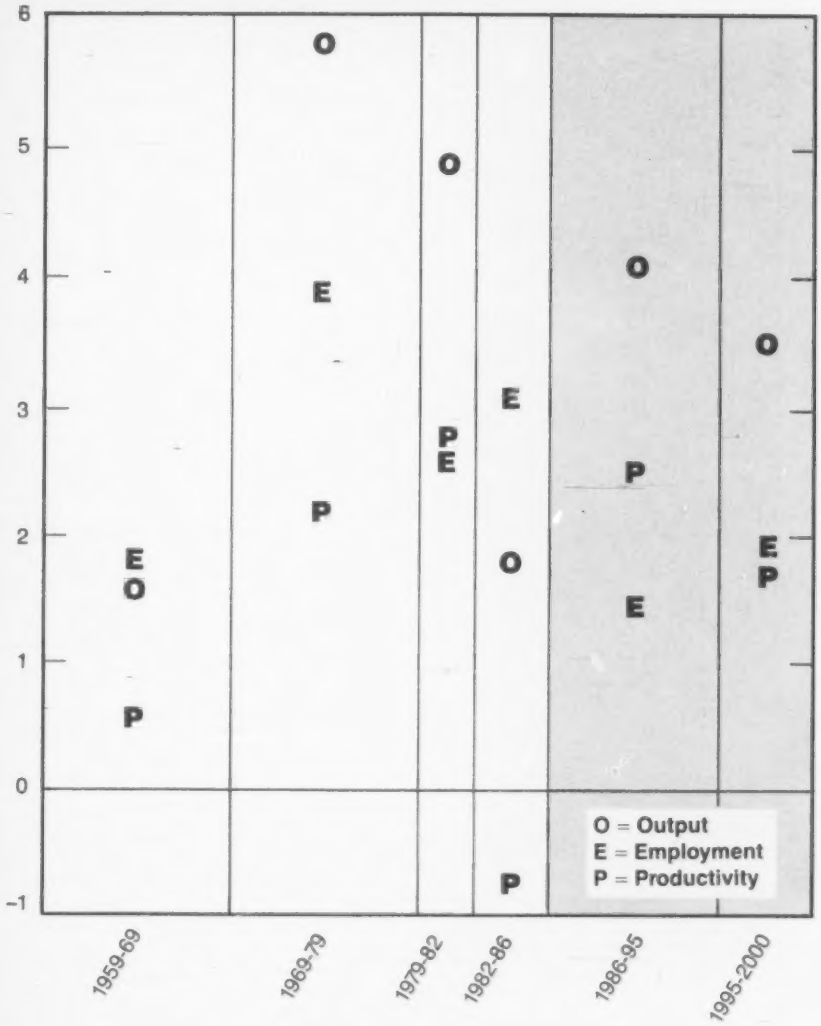


Level in 1986 of:
Employment
(Thousands of Jobs) 1,688
Output
(Millions of 1982$) 111,482

The output of these customer service industries is defined as business receipts. For the most part, the industry is characterized by very small firms in garaging; renting, servicing, and parking automobiles; and appliance, furniture, and jewelry repair (to name a few specific services).

All comments about employment and productivity found next to the chart on Personal and Household Services apply to these miscellaneous repair services as well.

Amusement Services



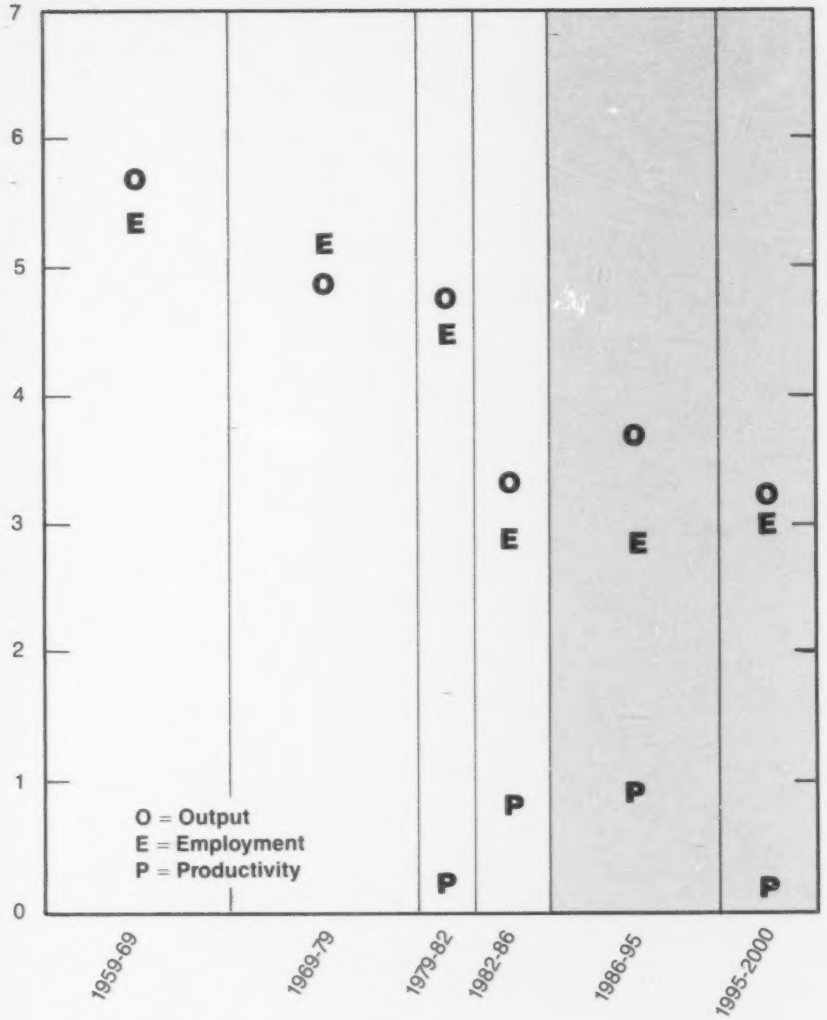
Level in 1986 of:
Employment
(Thousands of Jobs) 1,314
Output
(Millions of 1982$) 46,984

Industry output is defined as business receipts for sub-industries, such as movie production, theaters, commercial sports, commercial museums, amusement parks, activity clubs, and other miscellaneous entertainment activity businesses. Output growth of 3.1 percent during the 1980s is expected to increase to about 3.9 percent in the coming decade.

Employment growth, at a 2.9 percent rate during the 1980s, is expected to moderate to about 1.6 percent during the 1990s. In this industry, like retailing, there is a high component of part-time and temporary, or seasonal, employment. It seems likely that overall moderate growth for the entire sector conceals substantial shifts from one sub-industry to another as customer preferences change. Thus, bowling alleys and billiard halls have been declining in this decade, while commercial sports and membership sports clubs have been increasing.

Productivity, or output-per-employee hour, would be defined and measured in these industries as receipts per payroll hour. Productivity improvements are achieved at the micro level and, very often, by re-designing the amusement business service that is offered. Marketing and rapid response to customer desires are crucial to business efficiency and longevity.

Health Services

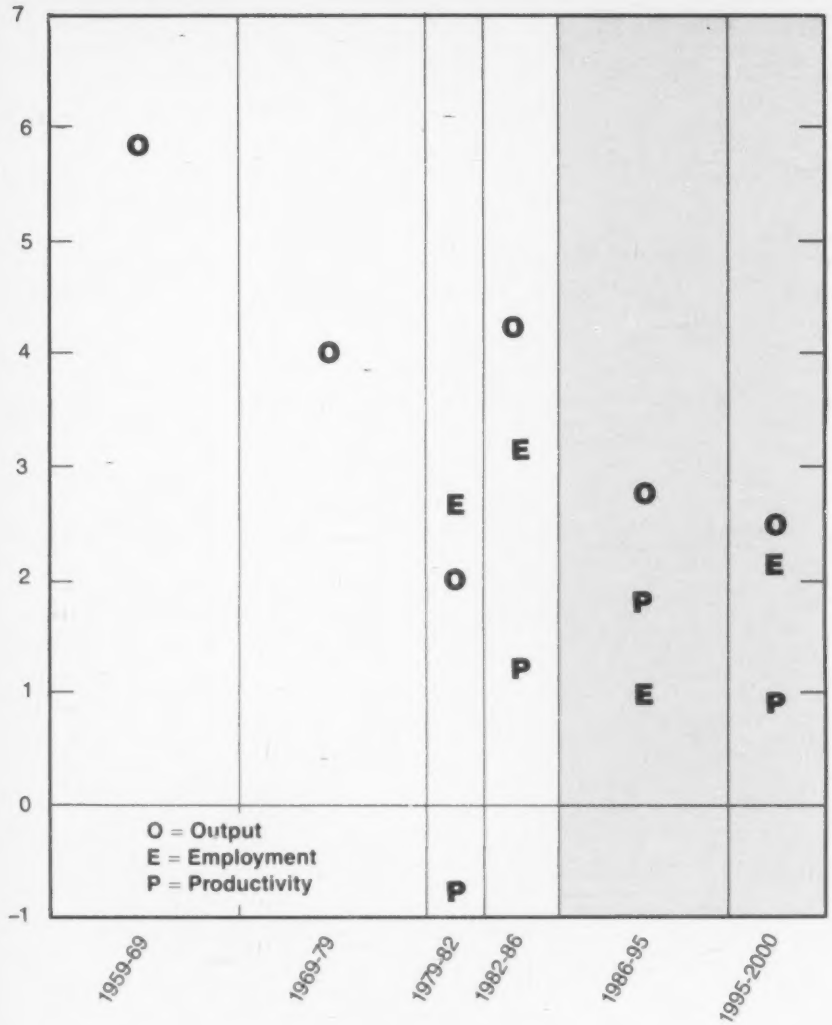


Level in 1986 of:
Employment
(Thousands of Jobs) 6,877
Output
(Millions of 1982$) 240,328

Output of health services has been soaring, with some reduced rates of growth during the 1980s and expected for the next decade. Output is defined as expenditures, public and private, for the various services of physicians, hospitals, etc. (and is, like all other output measures herein, deflated).

Employment growth has nearly paralleled output growth, implying no improvement in productivity. During the mid-1980s, it appears that there is some modest improvement in productivity, which the Bureau of Labor Statistics (BLS) model expects to persist through the early 1990s. However, with a rather circular measure of output, such productivity data are unreliable. Current efforts to reduce the rate of increase in health care costs, combined with demographic trends which seem likely to increase costs, may result in new approaches to rationing health care. The effect of rationing on output and "productivity" is difficult to predict.

Education, Social, and Other Services



Level in 1986 of:

Employment
(Thousands of Jobs) 4,727

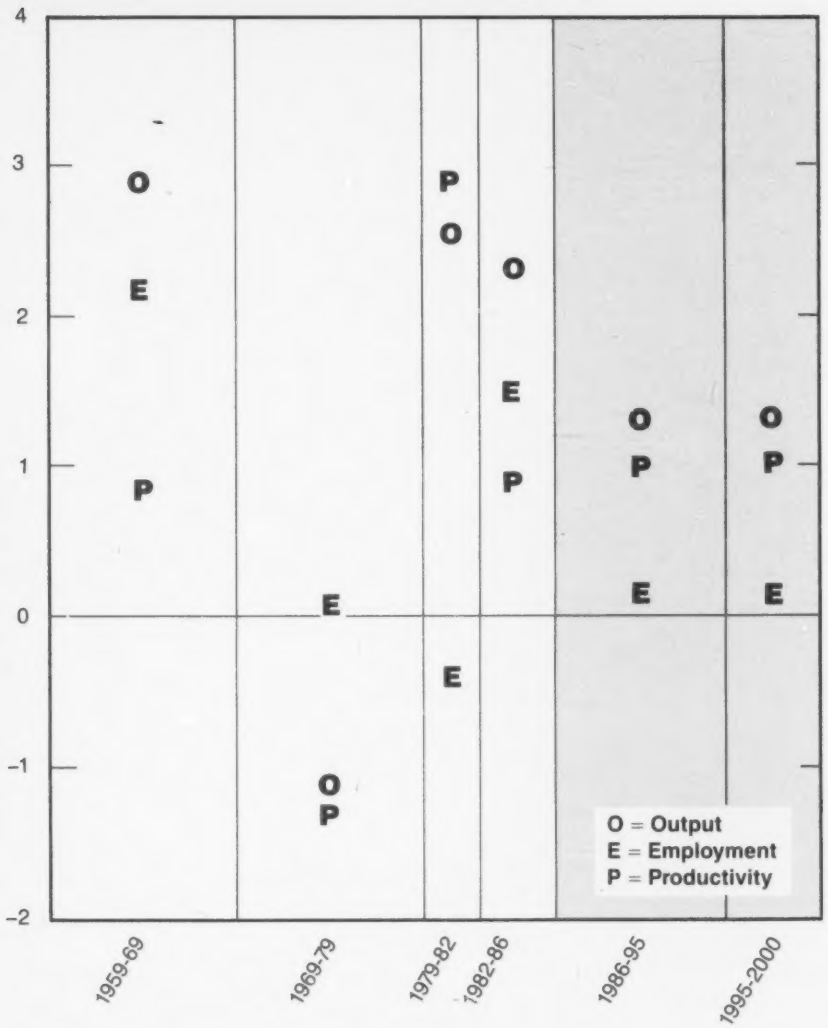
Output
(Millions of 1982$) 105,858

Output, measured as spending for private education, day care, membership organizations such as unions and alumni organizations, non-medical rehabilitation centers, non-commercial museums, etc., has been rising at a strong pace for the last 30 years. However, the rate of increase has abated to 3.3 percent annual growth during the 1980s, and is expected to drop to 2.6 percent a year for the rest of the century.

This labor-intensive sector, which is concentrated in providing personal and direct assistance to individuals, is expected to increase employment in the future by about 1.4 percent annually, on average.

Productivity declined slightly during the 1980s. For the next decade, a rate of increase of about 1.5 percent is expected by the BLS growth model.

Federal Government



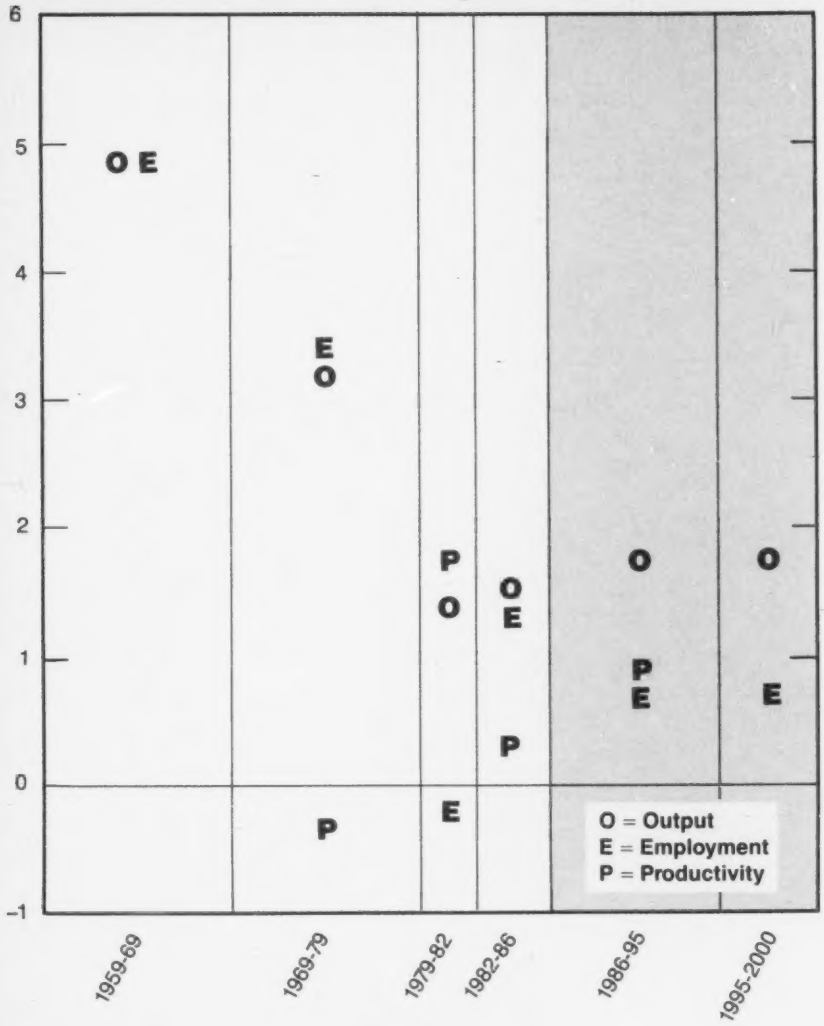
Level in 1986 of:
Employment
(Thousands of Jobs) 2,899
Output
(Millions of 1982$) 166,814

Output definitions for government activity are not useful. The most important one consists the compensation of government employees. Additionally, the definition includes postal service revenues, federal electric utility revenues, and fees for federally operated services.

Here again, and most obviously, the lack of an appropriate measure of total output (and therefore productivity) for the sector should not prevent productivity-enhancing management actions. These are always accomplished at the operating level, in any case. The more efficient processing of social security checks drastically improves productivity in that function. Better data for allocating revenue shares to the states improves efficiency and cuts costs to the tax-paying "customer" of this federal service. Procurement, especially military procurement, can be made more efficient in small steps at the office level—and tighter controls over spending can be introduced at the same time. The integration of all federal data collection cuts manpower costs (and respondent burden), while vastly improving the quality and timing of economic data.

Federal employment remained stable through the 1970s, but rose at a 1.4 percent rate starting with the new presidency in 1982. For the rest of the century, average gains of only .2 percent are expected.

State and Local Government



Level in 1986 of:
Employment
(Thousands of Jobs) 13,812
Output
(Millions of 1982$) 284,074

The output measure for state and local governments, like that of the federal government, is dominated by employee compensation. These employees work in education, hospitals, and the functions of general government (licensing, justice, etc.). In addition, revenues from government operations, such as local transit, water and sewage systems, transportation terminals, etc. are included.

Output measures rose about 1.5 percent annually during the 1980s, and are expected to continue that pace (at about 1.7 percent) during the 1990s.

Employment increases have been modest since 1980 (at a .7 annual rate of growth), and are expected to continue at that level for the rest of the century. Local transit employment jumped during the period 1979-1982, but its growth has moderated and will remain at about 1.4 percent from now on. Education employment has been growing by about 1.4 percent annually during the 1980s, and will be raising that rate of growth only to 1.6 percent for the next decade.

Productivity measurement is too weak, at the macro level, for general conclusions.